

TWO NEW SPECIES OF *MEGALOMMA* (SABELLIDAE) FROM SINAI AND NEW ZEALAND WITH REDESCRIPTIONS OF SOME TYPES AND A NEW GENUS

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ABSTRACT

Type specimens of *Megalomma* species are compared. *Megalomma intermedium* (Beddard) becomes a senior synonym of *M. hypsilophum* (Ehlers) and *M. monophtalma* (Augener). This species is transferred to a new genus but *Sabellula palmata* Quatrefages has priority. *Sabellula pacifici* Grube, *Sabellula modesta* Quatrefages and *Potamilla bioculata* Hartmann-Schröder are transferred to *Megalomma*. The latter thus becomes a junior homonym of *Megalomma bioculatum* (Ehlers), and is renamed. These, *Megalomma acrophthalmos* (Grube) and *M. coloratum* (Chamberlin) are figured, and two new species of *Megalomma* from Sinai and New Zealand are described.

Johansson (1927) proposed *Megalomma* for species of *Branchiomma* Kolliker, 1858, which have each radiole with a smooth outer surface and a single subterminal compound eye. Other species, having radioles with epithelial flaps (stylodes) and numerous paired eyes along their outer surfaces, were left in Kolliker's genus. Hartman (1938) studied type material in American museums, discovering further species of *Megalomma* and giving synonyms but no figures; Perkins (1984) provided good figures and synonyms of other American species.

The following studies are based on types (T = holotype, paratype or syntypes, N = neotype) or original material (O) from various museums and my own collections (KJC). Other initials denote museums or colleagues who have helped with information and material, named in full in the acknowledgements. Museum initials after the species name indicate that the material has been examined by me, unless marked by an asterisk. Some citations earlier than 1959, occurring in the lists of *Megalomma* species below, are not given in the references, but can be found in Hartman (1951). Sixteen of the 20 species in Hartman's (1959) list of *Megalomma* do indeed belong to the genus, but three names, *M. intermedium* (Beddard, 1889, figured, no type?), *M. hypsilophum* (Ehlers, 1920, O-ZMUH PE 1302) and *M. monophtalma* (Augener, 1922, T-ZMUH V 1792) are synonyms representing a single species, which is referred to a new genus. *Branchiomma linaresi* Rioja (1917) [= *Sabellula discifera* Grube and *Sabellula variabilis* Lange-rhans (e.g., Knight-Jones and Bowden, 1984)] was also included in *Megalomma* but wrongly, as its subdistal radiolar swellings lack ocular units and abdominal fascicles form pencil-like tufts. This species has been placed in *Sabella* (Knight-Jones, 1990). The revised list below includes four other species described since 1959, along with three transferred from other genera and redescribed from types and original material. One new combination is preoccupied so a new name is given. I believe that all valid names of *Megalomma* are in this paper. A neotype of *M. vesiculosum* is selected, as an aid to baseline studies. Seven species are described, of which two are new, four were previously unfigured and another needed renaming. Other species of *Megalomma*, most of which are well described and figured elsewhere, are placed in groups sharing similar characters.

Megalomma Johansson (1927)

Diagnosis.—Base of crown shallow, each half involuted dorsally and ventrally, margins without flanges; radioles without web or paired flanges, with subterminal compound eyes, ocular units forming band three-fourths of way around radiole tip, either transversely (giving a subglobular appearance, Figures 1G, 4B) or obliquely spiralling (Fig. 2C, D); eyes on most dorsal pair of radioles usually larger than others; tapered dorsal lips grooved and with midrib; anterior margin of first ventral shield rounded, but indented medially; collar chaetae in compact tufts; thoracic and abdominal uncini avicular with shafts about as long as or longer than distance between breast and crest; companion chaetae each with thin, broad blade tapering asymmetrically; abdominal chaetae in “rows” forming an elongate group transverse to axis of body (Fig. 1A; Knight-Jones, 1983; Perkins, 1984); interramal eyespots absent.

Type Species.—*Megalomma vesiculosum* (Montagu, 1815), neotype (NMW.Z. 1995.024), selected from material collected at low spring tide, St Anthony ($50^{\circ}09'N$ $5^{\circ}00'W$), 90 km west of the type locality, Kingsbridge Estuary ($50^{\circ}15'N$ $3^{\circ}45'W$). The dorsal collar of the neotype is figured below (Fig. 4M). Material from Gann Flats ($51^{\circ}42.8'N$ $5^{\circ}10'W$) near Milford Haven, agreeing well with the neotype, was figured in Knight-Jones, 1990.

Remarks.—It has been suggested by Hartman (1959) that *Sabella lanigera* Grube (1846, T-ZMB 136 type locality unknown) and *Branchiomma köllikeri* Claparède, 1868, Naples (apparently no type, but material so labelled, ZMB 6387) are junior synonyms of *M. vesiculosum* (Montagu). Both specimens are the same species, but differ from *M. vesiculosum* in having collar margins, especially those of the dorsal lappets, well above the junction between crown and thorax. Day (1967) figured such a collar for his South African material which he called *M. vesiculosum* and material from east Africa (kindly provided by A. J. Nilsen) is also similar. Pending further study it seems best to regard *lanigera* as a subspecies of *M. vesiculosum* and *köllikeri* a junior synonym of *lanigera*.

SPECIES OF *MEGALOMMA*

GROUP 1A (Figs. 1B, 2G, 4M). Collar margins fused to faecal groove, forming pocket on each side; subterminal eyes on most radioles:—*Megalomma vesiculosum* (Montagu, 1815), N-NMW.Z. 1995.024 = *Sabella arenilega* Quatrefages, 1866, O-MNHNP A240; *M. pacifici* (Grube, 1859), T-ZMUC, new combination =*Pseudopotamilla panamanica* Chamberlin, 1919a, T-MCZ 772; *M. vigilans* (Claparède, 1870, no type?, found under dorsal felt of *Aphrodite aculeata*, Soulier, 1903); *M. acrophthalmos* (Grube, 1878) T-MPW 364; *M. lobiferum* (Ehlers, 1904), additional figures in Perkins (1984); *M. suspicens* (Ehlers, 1904), O-ZMUH PE 1034–6; *M. claparedei* (Gravier, 1906), O-MNHNP A312; *M. circumspectum* (Moore, 1923), figured in Hartman (1969), T-USNM 17021; *M. pacificum* Johansson, 1927, ZMUU 161a-b (dried); *M. trioculatum* Reish, 1968, T-USNM 38408-9*.

GROUP 1B (Figs. 1F, 2Q). Dorsal collar as in Group 1A, but eyes on only two or occasionally 4 to 6 radioles:—*Megalomma modestum* (Quatrefages, 1866, as *Sabella*) O-MNHNP A241, new combination, =*Potamilla clara* Chamberlin, 1919b, T-MCZ 2171, =*P. anophthalma* Hartmann-Schröder, 1960, T-ZMUH P15435; *M. quadrioculatum* (Willey, 1905), ZMUH PE 1303, non type?; *M. splendidum* (Moore, 1905), T-USNM 5538, =*Pseudopotamilla anomolata* Moore, 1905 =*Branchiomma disparoculatum* Treadwell, 1905 (the two latter fide Hartman, 1959) =*B. burrardum* Berkeley, 1930, (with figures) T-USNM 32828; *M. roulei* (Gravier, 1907, figured 1909), no type?; *M. coloratum* (Chamberlin, 1919b), T-MCZ 2173.

GROUP 2A (Fig. 5F). Dorsal collar margins free (not fused to sides of faecal groove), sometimes with vestigial pockets and indistinct dorsal lappets; eyes on most radioles:—? *Megalomma neapolitana* (Claparède, 1868, as *Branchiomma vesiculosum* var. *neapolitana*) no type?; *M. heterops* Perkins, 1984.

GROUP 2B (Fig. 3C). Dorsal collar margins free, pockets and dorsal lappets absent; eyes only on most dorsal pair of radioles:—*Megalomma bioculatum* (Ehlers, 1887); *M. pigmentum* Reish, 1963

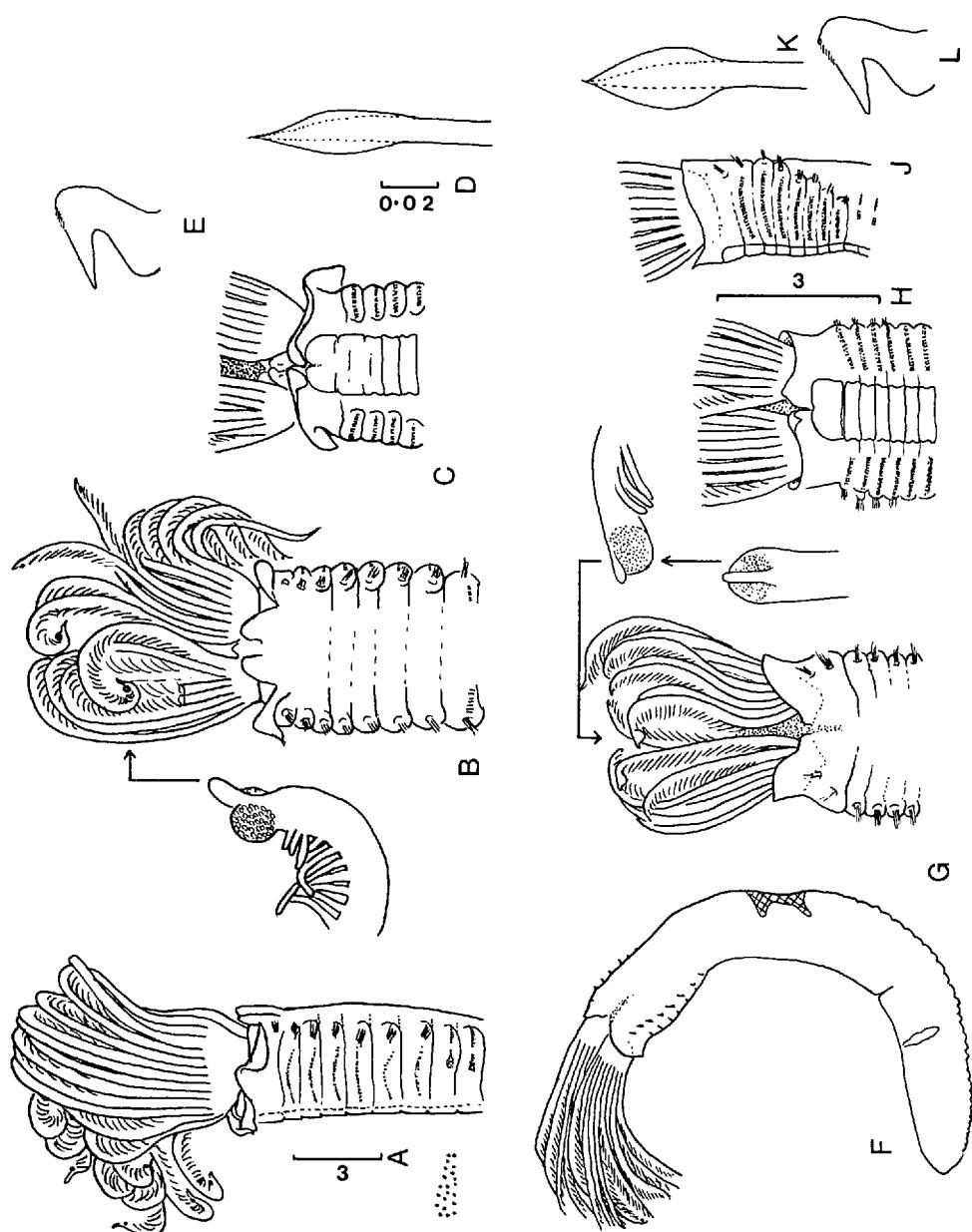


Figure 1. A-E *Megalomma pacifici* A, thorax and crown left side, insert showing arrangement of chaetae in abdominal fascicle; B, same, dorsal view, insert showing detail of most dorsal eye; C, anterior thorax, ventral view; D, inferior thoracic chaeta; E, head of thoracic uncus. F-L *Megalomma modestum*, F (MCZ), G-L (MNHNP): F, whole animal; G, anterior thorax and crown, with inserts showing two views of the right dorsalmost eye; H, same but ventral view; I, whole thorax left side; K, inferior thoracic chaeta; L, head of thoracic uncus. Scales in mm: B, C = A; E, K & L = D; G = H.

(additional figures of both species in Perkins, 1984) =*M. monoculata* Hartmann-Schröder, 1965, T-ZMUH P-15227.

GROUP 2C (Fig. 4E, F and N). Dorsal collar margins free, dorsal lappets freestanding (not attached to rest of collar and therefore pockets absent); eyes on most radioles:—*Megalomma mushaense* (Gravier, 1906, O-MNHNP A312).

Megalomma pacifici (Grube, 1859)

From Puntarenas, Costa Rica (Fig. 1A–E) has eyes on most radioles and a collar as in *M. vesiculosum*, but the collar is more shallow, especially the dorso-lateral pockets (Figs. 1B, 4M), the worm more plump (length of thorax less than twice breadth), crest teeth of each thoracic uncus more distinct and inferior chaetae of thoracic fascicles wider distally.

M. pacificum Johansson, 1927, is not a junior homonym, to judge from Articles 57 and 58 of the 1985 International code of Zoolological Nomenclature, Grube's specific name being genitive.

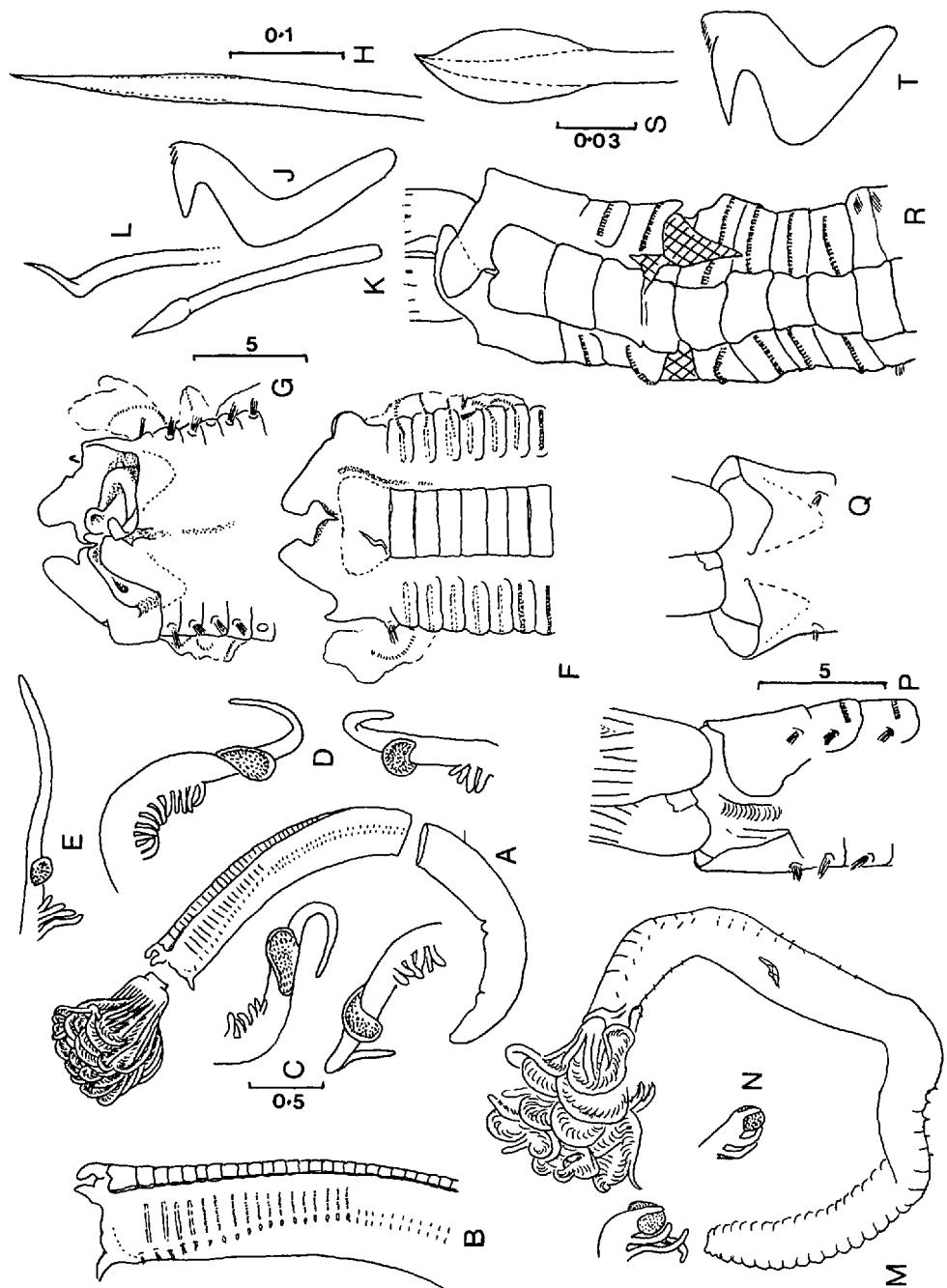
Megalomma modestum (Quatrefages, 1866)

From near Lima, Peru (Fig. 1F–L). The four original specimens (intermixed with two specimens of *Demonax*) have eyes (first noted by Grube, 1870) on only the dorsal-most pair of radioles. Unlike *M. vesiculosum* and *M. pacifici*, this species has a fused collar high laterally, without dorsal lappets, while the rows of thoracic fascicles lie oblique to the body axis, the length of the 2nd torus being twice the length of the last one (usually 8th, but one of Quatrefage's specimens has only 5 thoracic segments).

Megalomma acrophthalmos (Grube, 1878)

From the Philippines (Fig. 2A–L). This large specimen is said to be the same as the one studied by Grube (Dr. Jadwigor Wiktor, MPW, pers. comm.). It is of the size given by Grube, but in three pieces. The number of thoracic segments, however, is 18 whereas Grube noted 8. I cannot determine whether this discrepancy is due to a mistake by Grube or if the specimen is not the original one that Grube examined. Such a high number of thoracic segments is not necessarily specific, but other characters show that the species is different from others recorded. The specimen is plump (total length of first 8 thoracic segments equalling their width); most radioles bear globular eyes (Fig. 2E, these noted by Grube), but eyes on the most dorsal pair (somewhat hidden on account of the dorsal involution of the crown base) are spiral (Fig. 2C, D), like those of *M. splendidum*. The latter, however, has eyes on only two or three pairs of radioles. Johansson (1927) suggested synonymy of *M. acrophthalmos* with *M. vesiculosum*, because both have similar collars and slender inferior thoracic chaetae. *Megalomma vesiculosum* differs in having (1) all eyes subglobular, (2) fairly short ventral collar lappets overlapping medially, (3) a more slender body (the 8 segment thorax about three times longer than wide) and (4) finer teeth on thoracic uncinal crests.

Figure 2. A–L *Megalomma acrophthalmos*. A, whole animal in three parts; B, thorax right side; C, two views of dorsal-most eye on left; D, same, but eye from right side; E, smaller eye typical of those on other radioles; F, anterior thorax ventral view; G, same, dorsal view; H, inferior thoracic chaeta; J, thoracic uncus; K and L, companion chaetae, face and side views respectively. M–T *M. coloratum*: M, whole animal; N, large dorsal-most eye and smaller one typical of other radioles; P, dorsal anterior thorax; Q, same, but schematic showing deep (dotted line) flared collar pockets; R, ventral thorax; S, inferior thoracic chaeta; T, thoracic uncus (S & T drawn from Chamberlin's mount). Scales in mm: F = G; J, K, L = H; R = P; T = S.



Megalomma coloratum (Chamberlin, 1919b) (Fig. 2M–T)

Found at low tide, Laguna Beach, California. Chamberlin incorrectly regarded the dorsal margins of the collar as "free". The collar is torn on the right, but gentle lifting of the left side shows it to be fused to the side of the midline faecal groove. The dorsolateral pockets, which are deep (dotted line Fig. 2Q, a schematic reconstruction) and flared, had become folded at an angle of about 45° (Fig. 2P) against the wall of the tube. Several of the posterior thoracic tori have their ends touching the ventral shields, a character shared by only four other species listed above (*M. lobiferum*, *M. suspiciens*, *M. splendida* and *M. mushaense*). *M. modestum* (same coast) is like *M. coloratum* in having just one pair of subglobular eyes and a fused dorsal collar, but it differs in having much shallower dorsal collar pockets (Figs. 1G, 2Q) and a plumper body (thoracic length:breadth ratio 1:1 compared with 2:1 in *M. coloratum*). *Megalomma roulei* from Peru has chaetae (Gravier, 1909, Plate 18, figs 71–77) similar to those of *M. coloratum*. A dorsal collar with pockets flanking faecal groove was also mentioned, but not figured, and the type is not with Gravier's other material in Paris (J-CD, MNHNP). The species, however, seems to differ from *M. coloratum* in having a longer radiolar tip (Gravier, fig. 70) extending beyond each subglobular eye.

Megalomma gesae new name for *Potamilla bioculata*
Hartmann-Schröder, 1959

Nine paratypes ZMUH P-15245 (Fig. 3), holotype P-15246, from El Salvador. In this new combination, the name *bioculata* is preoccupied by *M. bioculatum* (Ehlers, 1887).

Description.—Body without crown 6.5 mm long, 0.45 mm wide, with 6 to 8 thoracic and up to 30 abdominal segments; crown 0.7 mm long with 5 pairs of radi-

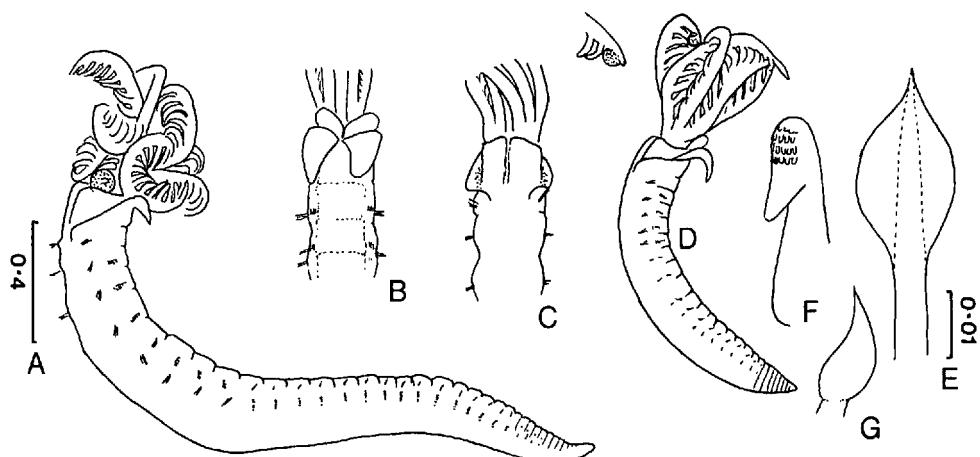


Figure 3. *Megalomma gesae* new name for *Potamilla bioculatum* Hartmann-Schröder, A, E, F, G from largest paratype:—A, Whole animal right side, showing eye on dorsal radiole recurred to base of crown; B, anterior thorax ventral view; C, same dorsal view, insert showing dorsalmost eye; D, another paratype showing posterior regeneration; E, inferior thoracic chaeta; F, thoracic uncus; G, companion chaeta blade. Scales in mm: B, C, D = A; F, G = E.

oles, each of most dorsal pair bearing relatively large eye with vestigial distal tip; first segment longer than broad; collar very oblique in lateral view, very low dorsally, with wide gap between short free margins (Fig. 3C), and relatively long ventral lappets; midline faecal groove well defined, not flanked by protruding ridges; chaetae and uncini few, inferior thoracic chaetae broad distally (Fig. 3E).

Remarks.—*Megalomma bioculatum* Ehlers and *M. pigmentum* Reish also have an oblique collar with free dorsal margins, and eyes only on the most dorsal pair of radioles. Both species, however, are much larger, with relatively small ventral lappets (Perkins, 1984, figs. 38 and 41) and the inferior chaetae of thoracic fascicles are narrower. Neither, moreover, (nor any other species of *Megalomma*) has the first segment longer than broad. Gesa Hartmann-Schröder, after whom this species is named, was mistaken in regarding the first segment as short, as her figure shows.

Megalomma nechamae new sp. (Fig. 4)

From El Bilaiyim, Gulf of Suez Holotype (HUJ-Poly 35) and 5 paratypes (HUJ-Poly 36–40) also found at Elat (HUJ) and in the Red Sea (ZMUTA NS 2570 and Israel South Red Sea Expd., ZMUTA 11 1661).

Branchiomma vesiculosum—Fauvel (1933), Gulf of Suez Stn XVII MNHNP A312.

Description.—Largest specimen (holotype) 80 mm long without crown, 7.5 mm wide, with 8 thoracic and about 140 abdominal segments; thorax 1.5 times as long as wide; crown 28 mm long with 34 radioles each side; each dorsal lip finely tapered with midrib, tip extending about 6 mm from base of crown; most crown radioles with subglobular eyes, those of most dorsal pair unusual in being similar in size to those on other radioles; collar with short ventral lappets overlapping medially, dorsal margins free separated by wide gap, in which freestanding L-shaped dorsal lappets (mirror images of each other) arise at anterior edge of first segment, flanking but not fused to sides of faecal groove (Fig 4E) and point-

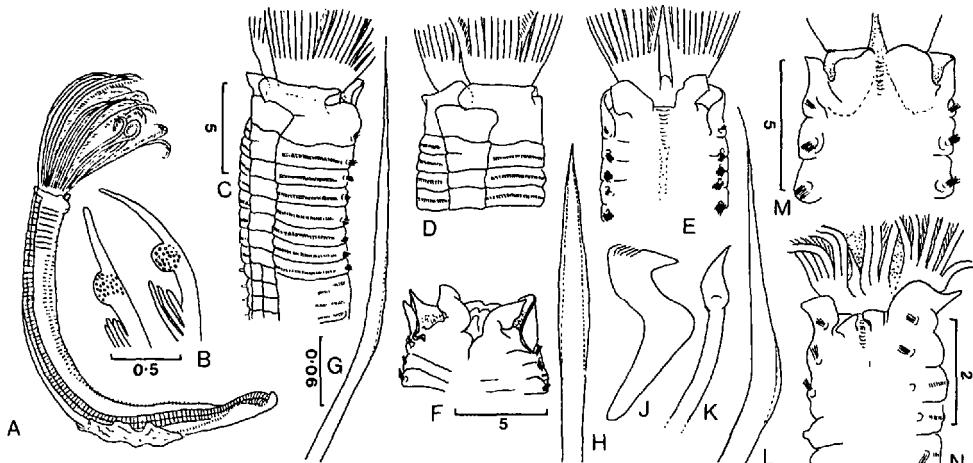


Figure 4. A–L *Megalomma nechamae* new species: A–E, G–L, holotype: A, whole animal left side; B, two dorsalmost eyes; C, thorax, detail of A; D, ventral collar; E, dorsal collar and freestanding lappets; F, same, but from Elat specimen; G, superior thoracic chaeta; H, inferior thoracic chaeta, face view; J, thoracic uncinus; K, companion chaeta; L, abdominal chaeta, side view. M. *vesiculosum*:—M, dorsal collar. M. *mushaense*:—N, dorsal collar. Scales in mm: D, E = C; H to L = G.

ing away from groove; most thoracic fascicles each with about 100 chaetae; collar chaetae like superior chaetae of following thoracic fascicles (Fig. 4G), inferior thoracic chaetae and chaetae from abdominal fascicles geniculate, slightly wider at knee than shaft (Fig. 4L); thoracic tori long, most touching or indenting ventral shields; thoracic uncini with distinct, finely toothed crest (Fig. 4J), abdominal uncini similar but with shorter shaft; companion chaetal blades like asymmetrical teardrops; holotype pale but with liver-brown crown rachids, blotches at dorsal ends of thoracic tori and smaller ones at ventral ends of abdominal tori; some specimens with similar pigment over most of thorax (not on uncinal ridges) and anterior abdominal ventral shields; tube leathery basally, softer distally, with outer layer of sand, gravel or shell, according to substratum.

Remarks.—Fauvel (1933) mistook this species for *Megalomma vesiculosum*, which has similar inferior thoracic chaetae, but so have *M. acrophthalmos* Grube, *M. suspiciens* Ehlers and *M. pacificum* Johansson. All four species differ from *M. nechamae* in having collar margins fused dorsally at the midline, forming flanking pockets (e.g., Fig. 4M). The only other species with freestanding dorsal collar lappets is *M. mushaense*, but their orientation and position are different. In *M. mushaense* the L-shaped lappets have their free ends pointing towards the midline faecal groove and they arise about level with the main part of the collar (Fig. 4N). Such lappets in *M. nechamae* arise and extend more anteriorly. This difference is not size-related. A small specimen of *Megalomma nechamae* (one of the paratypes, 36 mm long without crown and 4 mm wide) was carefully examined and found to have similarly prominent dorsal lappets with the same orientation and position as in the holotype. *Megalomma mushaense* also has long thoracic tori, abutting the shields in the posterior half of thorax, but the species differs from *M. nechamae* in being (1) much smaller, and in having (2) inferior thoracic chaetae with the distal part broad and lance-like, and (3) eyes on most dorsal pair of radioles larger than the others. The only other species resembling *M. nechamae* in having dorsalmost eyes no larger than those on adjacent radioles is *M. suspiciens*, but that species differs in having the dorsal collar fused to the midline.

The type material was collected by Dr. Nechama Ben-Eliahu. It is named after her, both in respect of her work and for her kindness when I visited Israel.

***Megalomma kaikourense* new species**
(Fig. 5)

Holotype (NMW Z.1995.025.1) and five smaller paratypes (NMW Z.1995.025.2 and KJC). Collected at Kean Point near Kaikoura, west of the Marine Station (University of Canterbury) on east coast of New Zealand, 42°25'S. Measurements of a complete paratype in parenthesis.

Description.—Body of holotype (incomplete posteriorly) 9(6) mm long without crown and 0.8(0.5) mm wide, with about 44 segments including 8(6) in thorax; crown 3(1.8) mm long; radioles with eyes only on most dorsal pair near tips, length of each free tip about equal to diameter of eye; collar with lateral margin not quite reaching junction of crown and thorax, ventral lappets rounded not overlapping, dorsal margins not fused to sides of midline groove, well separated from each other exposing much of the dorsal first segment, but basally curving towards the midline reminiscent of vestigial pockets (Fig. 5B); midline groove flanked by obtuse longitudinal ridges, but in one of the paratypes these ridges are sharper, similar to rudimentary dorsal lappets (Fig. 5F); collar fascicles with slender slightly geniculate chaetae like superior chaetae (Fig. 5H, about 5 per fascicle) of rest of thorax; inferior chaetae of thorax broad and lance-like (Fig. 5G, about 8 per fascicle); thoracic tori short, with wide gaps between ends and ventral shields;

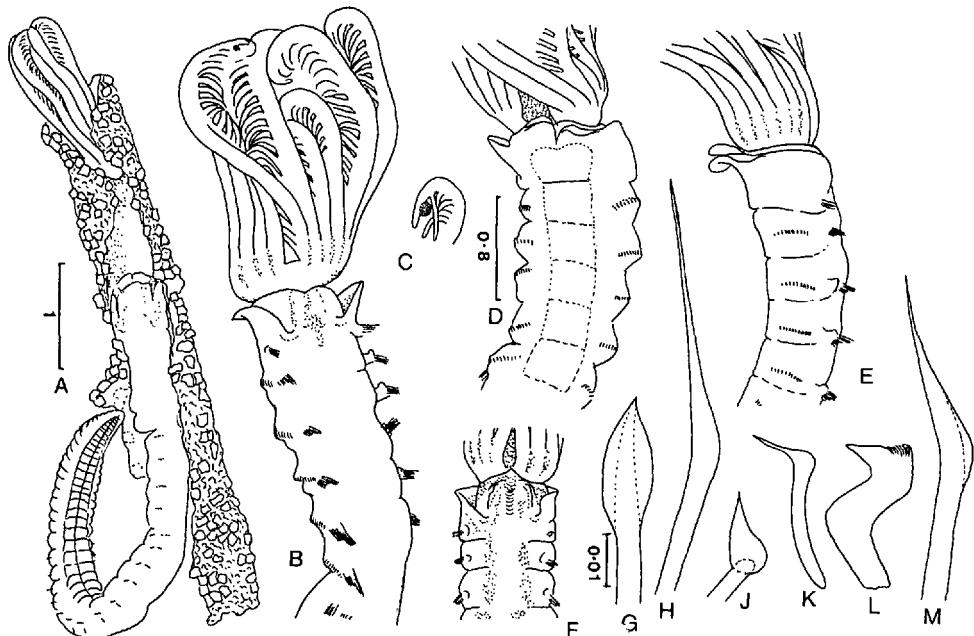


Figure 5. *Megalomma kaikourense* new species, holotype B–E, G–M: A, whole paratype with detached crown within tube; B, thorax, dorsal view; C, detail of eye from dorsalmost radiole; D, thorax ventral view; E, thorax lateral view; F, dorsal anterior thorax of a paratype; G, inferior thoracic chaeta; H, superior thoracic chaeta; I, K, companion chaetae, face and side views respectively; L, thoracic uncus; M, abdominal chaeta. Scales in mm: B, E, F = D; H – M = G.

thoracic uncini (4 per torus) with finely toothed crests and relatively short shafts (Fig. 5L), their companion chaetae geniculate in side view (Fig. 5K) with teardrop-shaped blades (Fig. 5J); abdominal uncini similar; abdominal chaetae geniculate and swollen at knee; tube with smooth lining and outer layer of sand grains. Most specimens pale with dark eyes, but one specimen flecked with liver brown, especially on thorax (Fig. 5F).

This species was found among coralline algae in lower shore pools on a bedrock platform, protected from waves by offshore rocks and gulleys, at the foot of cliffs at Kean Point.

Remarks.—One paratype with about 50 abdominal segments showed regeneration posteriorly, so this species may be scissiparous. The collar, with vestigial pockets and vestigial dorsal lappets, recalls *Megalomma heterops* Perkins (1984), but that species has eyes on most radioles and is very large and plump, thoracic length/breadth ratio 1.5:1 compared with 4:1 in *M. kaikourensis*. Because of the intermediate shape of the collar, comparisons were made with other species that have just one pair of eyes (groups 1B and 2B), but all are much larger species with a variety of distinct differences. *Megalomma gesae* is somewhat similar in being small and having a low collar, but it differs in having the 1st segment longer than wide, longer ventral lappets and eyes relatively smaller with radiolar tips somewhat longer.

Styloamma new genus

TYPE SPECIES.—*Styloamma palmata* (Quatrefages, 1865, as *Sabellula*) (O-MNHNP A313) = *Branchiomma intermedium* Beddard, 1889, figs 4, 5, 6, no type, = *Branchiomma hypsilophum* Ehlers, 1920, pl.III, figs 13–15, (O-ZMUH PE 1302) = *Sabella monophthalma* Augener, 1922, figs 9, 9a and 9b. (O-ZMUH V 1792) = *Sabella nudicollis* Pruvot, 1930, pl.II, figs 33–36 (T-MNHNP A246).

Diagnosis.—As *Megalomma* except. Crown with long stiff base, not involuted dorsally, dorsal margins of each half with sharp narrow flanges extending to base of radioles; radioles webbed basally (about 0.2 of length), with paired longitudinal flanges extending from web to tips and subterminal single, compound, globular eyes at ends of short stalks, all eyes similar in size; first ventral shield with straight anterior margin; mature abdominal fascicles arranged in C-shape; interramal eyespots present.

Etymology.—From the Greek *stylos*, a pillar or post, referring to the “stalk” that bears each eye (*omma*). Gender neuter.

Remarks.—The base of the crown is somewhat like those of *Pseudopotamilla* (Knight-Jones, 1983, fig. 3A) and *Notaulax* (Perkins, 1984, fig. 27A and B), the C-shaped arrangement of chaetae in the abdominal fascicles is like that found in the genus *Bispira* (Knight-Jones et al., 1991), and the straight anterior margin of the first thoracic ventral shield is like that of *Sabella*. These relationships, and associated arrangements of abdominal chaetae and positions of eyes, are discussed elsewhere in a review of *Sabella* and *Bispira* (Knight-Jones and Perkins, MS. submitted).

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